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TITLE: MULTI-FAMILY GROUP INTERVENTION FOR OEF/OIF TRAUMATIC BRAIN INJURY SURVIVORS AND
THEIR FAMILIES

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14. ABSTRACT The overall aim of this study is to evaluate the feasibility and preliminary efficacy of an intervention that adapts Dyck's civilian multi-family group treatment model (MFGT-TBI) for veterans with TBI and their families, to improve the health, mental health and quality of life for veterans and their families. To date, the Durham site has enrolled 11 veterans and family members. Baseline assessments have been completed for all of the subjects. In Durham, the first group, which consisted of 4 veterans and family members ran for nine months and was completed in June 2010. The second group in Durham, which consists of 5 veterans and family members (2 couples dropped out), began in March 2010 and members have completed baseline follow-up assessments. In the Bronx, the initial one planned group began in September 2009 and 5 veterans and family members were enrolled. Baseline and follow-up assessments were administered, and the group was completed in June 2010. The New Jersey site withdrew and following approval of a revised Statement of Work adding a one-year NCE for the Bronx to conduct a second MFG to replace the NJ group, and Bronx VA IRB approval for this group in June, recruitment was initiated and 3 veterans and families were consented. However, enrollment for the second group is currently on hold pending DoD HPRO approval for this amendment.					
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Introduction

The overall aim of this study is to evaluate the feasibility and preliminary efficacy of an intervention that adapts a civilian multi-family group (MFG) treatment model for veterans with TBI and their families. A total of four MFGs will be established across three sites. Each MFG will include approximately 5-8 veterans and their caregivers.

Participating veterans will be assessed at four points during the course of the study: at baseline and at 3-month intervals during the 9-month treatment period. Expected outcomes for veterans include reductions in psychiatric symptoms and problem behaviors, and increases in community reintegration and quality of life. For caregivers, expected outcomes include reduction of distress, isolation and burden.

Research Accomplishments Associated with Statement of Work Aims/Tasks

Aim 1: To customize Multi-Family Group treatment (MFGT-TBI) to address the specific needs of veterans with TBI and their caregivers.

Tasks: (1) We will adapt the manual for MFGT-TBI used by Rodgers et al for use in the study population and settings. We will review educational material for patients and family members on TBI, and the most suitable selected or adapted for use during the intervention.

During the first 6 months, the investigators began to adapt Dyck et al.'s manual, used in his civilian TBI study, for veterans injured during OIF/OEF in combat. Although this task was initially slated for the first 6 months of study, in practice we have found that relevant information guiding adaptation emerges as the intervention itself has progressed. Changes to date have mainly been reflected in modifications to the Educational Workshop, in which all the families gather for the first time education about TBI, associated conditions, treatment and impact on families. Materials are presented mainly via powerpoint, with ample time for discussion and socializing. Specifically, the MFGT Educational Workshop was revised to incorporate material on the military experience, the pathophysiology and treatment of TBI associated with missile blasts, and comorbid conditions, such as post-traumatic stress disorder, substance abuse and depression. Drs. Robin Hurley and Katherine Taber provided state-of-the art educational materials on IED-related TBI for the workshops. Dr. Adrian Cristian, study Co-Principal Investigator and Director of Rehabilitation Medicine and the Polytrauma unit at the Bronx VAMC provided simplified materials on basic neuroanatomy and brain functions/dysfunctions (i.e. what dysfunction might result from an injury to a given area of the brain), common IED injuries and their sequelae, and functional limitations associated with combat-related TBI as experienced by the veterans and family members. Dr. Melissa Altman, a local expert in diagnosis and treatment of PTSD, gave a detailed, interactive presentation of the major symptoms of PTSD as experienced by veterans and family members, and the relational and functional problems created by the symptoms, especially if the PTSD behaviors were not understood as part of a disorder. These presentations from local experts were well-received by the veterans and their family members and the material from the Bronx workshop has been provided to Durham for use in their second workshop.

In addition to changes in the Workshop, the Joining session structure and contents was adapted to reflect changes in the patient population. In contrast to the civilian TBI survivors in the Dyck et al study, our veterans are relatively young (mean age = 35.6 ± 9.2 years in our study vs 39.3 ± 11.3 years in the Dyck study) and the family members are spouses or significant others vs. parents. Clinically, we have found that the younger age, combat and multiple deployment experience, comorbid PTSD (present in 70% of our vets) and associated symptoms of emotional numbing, and often presence of young children in the household, leads to frequent marital tensions/dissatisfaction. Although not in the Dyck manual, we found that these tensions and conflicts needed to be addressed and acknowledged, in order to be able to proceed with the traditional Joining exercises, e.g., enumerating strengths and weaknesses. In cases where the conflict was relatively

mild and appeared related to common problems relating to TBI and the military experience, this involved simply helping the couple to identify and clarify these issues as issues in common with many vets to be addressed during problem-solving exercises in the group. In other cases where the degree of conflict was so high and/or not related to TBI, time-limited couples' therapy was felt to be needed in addition to the MFGT, as the MFGT structure does not allow for in-depth discussion of individual marital issues. This was worked out in supervisory sessions with Ms. Norell and with the PI and communicated to the couples by the clinicians during the joining sessions.

In future groups with OIF/OEF vets it would be appropriate to incorporate a marital satisfaction scale into the assessment. This issue is also relevant to the issue of therapist characteristics for this intervention with this population. At least one of the therapists should be experienced in couples' counseling as well as family psychoeducation. Fortunately, both the Bronx and Durham have an experienced couples' therapist as an MFGT co-leader. These changes, based on relatively recent observations are currently being incorporated into the manual. With respect to the post-workshop group sessions, based on Durham's initial experience, it appears that the pace of the intervention may need to be picked up. For example, the Dyck manual, based on the MacFarlane model for SMI, allocates the first two sessions for the group members to get to know each other, more generally in Session 1 and in relation to the TBI in Session 2. Problem solving begins in Session 3. However the Durham clinicians reported that their vets and families had explicitly said they were eager to get going with problem solving, and that the contents of both Sessions 1 and 2 had been well-covered in Session 1. Although the vets have some level of cognitive impairment, they are combat veterans and are action-oriented. They and their partners are relatively young in comparison to the group members in the Dyck et al. study. It was decided that it was a positive sign overall that the group members were eager to begin problem-solving, and it was decided to begin problem-solving with the caveat that the clinicians be attentive to signs that the group needed to slow down, if for example, solutions suggested to TBI-related problems appeared to reflect insufficient knowledge of the individual situations/limitations of the vet and family member elected for the problem-solving exercise in a given session. Because the vets are action-oriented, there may be a tendency to jump ahead, without fully understanding the problem and its context. The clinicians and Ms. Norell will make this differentiation as the groups progress. Dr. Perlick, herself an experienced family and couples' therapist, is also attending the supervision to participate in discussions related to potential manual changes, to help guide and document these.

As we have previously appended the Educational Workshops used in both sites, which differ somewhat (reflecting differences in local expertise), we are not appending at this time.

(2) We will hire research assessors and train them to obtain informed consent and deliver all study instruments including neuropsychological assessment tools.

In addition to the site PI's and clinicians, research assistants at each of the three sites were recruited and hired. This required not only processing by the VA Foundation, but processing the RA's as employees without compensation (WOC's) at each site.

Training in administration of the neuropsychological measures for the research assistants was completed at the two sites by neuropsychologists serving as VA diagnosticians of TBI. In addition, the core study staff (PI's and research assistants) attended a web-based training in administration of the Columbia Suicide Severity Rating Scale conducted by Kelly Posner, Ph.D., and received certificates for their attendance.

In July 2010 a new RA was hired at the DVAMC site to replace the existing RA who was leaving for medical school. In September 2010 an additional RA, who had been previously been on the protocol during summer of 2009, was hired at the Bronx VAMC site. All new RA's were trained on the study instruments and the neuropsychological battery.

(3) We will obtain regulatory review and approval for the study.

Protocol summaries, informed consent forms, and other required materials were prepared at the two study sites and submitted to the respective Internal Review Boards. The Bronx and Durham and finalized approval from both the Internal Review Board and Research and Development Committees, and from the U.S. Army Medical Research and Materiel Command as well. Following the initial approval, amendments were submitted in order to add new personnel to the protocol and to refine the assessment battery to capture important outcomes. Quarterly Technical Progress reports for the seven quarters of the study were submitted to and approved by the USAMRMC. In addition, Continuing Review Documents were submitted to the USAMRMC in August, 2010. We are currently awaiting DoD HRPO approval for the amendment to add additional subjects at the Bronx site.

Aim 2: To evaluate the feasibility of MFGT-TBI within VA by establishing four MFGs.

Tasks: (1) A minimum of two clinicians per site will be trained to deliver MFGT-TBI, one of whom will have prior experience of managing patients with TBI.

A two-day training workshop in conducting the multi-family group therapy was held in November, 2008. Dr. Dennis Dyck and Ms. Norell (MFGT experts), and clinicians from Durham and New Jersey all convened in the Bronx for two days, as well as the PI and Bronx RA. The training was comprehensive, including role-playing of MFGT group members by the clinicians. It was also an opportunity for the study team to come together as a whole and develop a sense of cohesiveness. In May 2009, Ms. Norell, MFGT expert and supervisor, designed a three-part training protocol to train the new family clinician in NJ in the MFGT protocol. In addition, some of the other clinicians participated as well, as a 'refresher'. The training consisted of: 1) background reading; 2) one, two-hour and a second, one-hour teleconference training session in which the basic principles of MFGT were explained by Ms. Norell; 3) viewing a video demonstration of a previously taped MFGT. This training was completed during the third quarter. In addition, at each site, clinicians from psychiatry and those with experience with TBI patients were trained.

(2) At the JJPVAMC VISN 3 site and the DVAMC VISN 6 site, two MFGs of 6-8 veterans and their family members will be established.

In the VISN 3 site at the Bronx, the first MFG, which consisted of 5 veterans and their family members and began in September 2009, was completed in early June 2010. Although the study team in the Bronx began recruitment to enroll additional veterans for a second MFG in June 2010, after receiving an approved revised SOW from DoD and Bronx IRB approval, we closed recruitment in late June pending DoD HRPO approval of the amendment to increase the number of participants at the Bronx site which has not been received to date. The second MFG in Durham began in March 2010. This group, which consists of 5 veterans and family members, has completed 3 month follow-up assessments (Seven veterans and family members were originally enrolled in the group, but two couples withdrew.)

In terms of feasibility, recruitment for this study has been more difficult than anticipated. The barriers relate: 1) to the characteristics of the study population itself; 2) to existing protocols for the clinical diagnosis and treatment of OIF/OEF vets within VA, and; 3) to the staffing and recruitment/diagnostic methods within the current protocol. *Study Population:* The initial IRB protocol required veterans who were informed of the study by their clinician to explain the study to first give written informed consent, and then describe the study to their family members (aided by a brochure) and obtain verbal consent from the family member himself, after which an appointment could be scheduled with research staff to answer the family's questions and obtain consent. However, even when the veterans were interested, due to their cognitive impairment, they were often unable to effectively explain the study to their family members. They were also reluctant to sign consent without knowing if their family member would be willing to attend. To address these issues, an amendment was submitted (and ultimately approved) that allowed the study's family clinicians to contact the family members with the veterans' verbal approval. The veterans' cognitive impairment also affected their ability to remember recruitment appointments with the study team, resulting in a very high proportion of missed appointments, despite reminders. In addition to the veterans' cognitive impairment, there are multiple practical/logistical challenges and life events that veterans and their family confront on a daily basis. Appointments were often difficult to schedule, as many veterans already had a large number of therapy, and rehab appointments scheduled, and found it difficult to add more. Veterans and their family members were also burdened by competing demands such as work, child care, and a relatively high frequency of negative life events such as legal problems/ court appearances, accidents/ injuries, miscarriage, and theft victim (to which many veterans seem vulnerable). In order to help accommodate the family members, the study team added more evening appointments.

Diagnostic and Treatment of TBI at VA:

The study protocol relies on clinical diagnosis of TBI. While there is a mandatory screen for TBI within VA, procedures for following up on the screen, diagnosing and

treatment/services for TBI are different within different facilities, and is frequently split between several services within a given facility: the OIF/OEF service, polytrauma/rehabilitation medicine, physiatry, or psychiatry for treatment of comorbid PTSD or depression. In the Bronx, for example all positive screens are followed up with a clinical diagnostic interview by Dr. Cristian or one of his colleagues and a careful history coupled with a mental status exam is employed to make the diagnosis. Those diagnosed with TBI will be treated in rehab medicine but may also be referred to other services for treatment of comorbid conditions such as PTSD, marital distress, depression or vocational counseling. Although we are fortunate in the Bronx and in Durham that the services cross-refer and communicate well, liaising with the relevant treatment teams./treators across services has added a considerable layer of complexity to recruitment, especially as the PI and study clinicians were based in psychiatry. It has taken many months to develop effective, ongoing referral/communication channels between services and these could still be improved (see below). The situation is similar in Durham, where, with post-deployment as the theme for the VISN 6 MIRECC there are positive working relationships between services treating the vets, nonetheless coordination or recruitment efforts by psychiatry with the services diagnosing and treating the vets is complex and time-consuming. In New Jersey, positive TBI screens were followed up by neuropsychological testing: however blast exposure and display of cognitive deficits was not considered diagnostic in the presence of comorbid PTSD or substance abuse, and these individuals were referred to psychiatry but not diagnosed with TBI. There is a large OIF/OEF service in NJHCS where veterans are seen by case managers but these veterans are not referred to other services.

Study Staffing and Recruitment/Diagnostic Protocols:

In view of the complexities of recruitment outlined above, and the amount of front-end work needed, fuller staffing is required for effective recruitment particularly if a larger program were to be mounted. A full-time, clinically trained, Ph.D. or advanced masters' research coordinator is needed at each facility to follow through on clinician referrals with the vet and family member, and to liaise between different services to maintain high visibility and generate a high rate of referrals. Ideally, this individual would be integrated into the treatment/diagnostic team and might even help with some follow-up of screens so they would be there when it counted. A research assistant is also needed for assessment, tracking referrals and generating reminder lists, making reminder phone calls, helping the project director prepare regulatory documents, enter data and so forth. The Dyck et al study was staffed by two full-time clinicians, a FT doctoral level project director and a FT research assistant. It would also be helpful to standardize methods for diagnosis across sites, and ideal to have study staff assist in the follow-up to positive screens. Finally direct outreach to family members i.e. through mail to all OIF/OEF vets at a facility (without identifying the vet as someone with TBI) would be helpful as there are many steps before a research staff member can even describe the study to family members.

In conclusion, while there is much enthusiasm for the MFG among current participants and clinicians, feasibility could be significantly enhanced in the future with some modifications in protocol/study staffing.

(3) The supervisor for clinicians will rate their competence and fidelity to the MFG model.

The supervision is ongoing for the Durham group. In Durham, sessions have been taped and are being sent from Durham to Diane Norell, the study's multi-family group therapy supervisor, in encrypted form, so for the rating adherence and fidelity. In the Bronx, initially two veterans refused to be taped, so process notes were used as a replacement. However, in preparation for future enrollment, an amendment was submitted and approved to allow for the taping and sending of sessions for adherence (in accordance with IRB privacy and security regulations).

(4) We will use data from written evaluations by veterans and family members and data from focus groups debriefing clinicians after the first two post-workshop phases to make modifications if needed.

A focus group was conducted for the first MFG in Durham in August 2010. The tape recorded dialogue from this focus group were transcribed. Several attempts were made to schedule a focus group from the first MFG in the Bronx, but on each occasion, only one family attended, reflecting a general drop-off in attendance in this group after the first 6 months. In lieu of a focus group, clinical notes of the reactions of each couple to the MFG were made.

Aim 3: To evaluate MFGT-TBI's efficacy in reducing psychiatric symptoms and problem behaviors and increasing community reintegration and quality of life among veterans with TBI, and reducing caregivers' distress, isolation and burden.

Tasks: (1) All participants will be interviewed using standardized measures at baseline, immediately after the one- day workshop, and then at three three-monthly intervals until the end of the intervention.

All veteran and family participants were interviewed using standardized measures at baseline and will be re-assessed a three-monthly interviews until the end of the intervention and three months after the completion of the intervention. The assessment immediately after the one-day workshop has been discontinued. This was done in part due to concerns about validity of the data arising from too-frequent repetition, little or no expectation that significant change would occur following the joining and introductory workshop, and the wish to reduce participant burden.

In addition, several additional relevant measures were added to the assessment battery. Specifically, these measures included: the Columbia Suicide Severity Risk Scale (Posner et al., 2007), used to measure suicide risk; a modified version of the Patient's Health Questionnaire (Spitzer et al., 1999), used to measure presence of Major Depressive Disorder, Anxiety Disorders and Alcohol Use; the SF-36 (Ware et al., 1992), used to measure veteran and family Member physical and emotional health; the 4-item Perceived Criticism Scale (Hooley & Teasdale, 1989), used to measure perceived

criticism; and the Family Empowerment Scale (Koren et al., 1992), used to measure family empowerment. There was also a deletion of the Life Satisfaction scales of the and the substitution of these more sensitive measures: the Heinrichs-Carpenter Quality of Life Scale Intrapsychic foundations subscale (Heinrichs, Hanlon & Carpenter, 1984); the Ways of Coping (avoidance and emotion-focused subscales) (Scazufca & Kupier, 1999); and the abbreviated Duke Social Support Scale (Koenig et al., 1993). Lastly, two brief measures, the Life Events Checklist (Gray et al., 2004) and the Pittsburgh Sleep Quality Index (Buysse et al., 1989) were also added by the investigators as additional, relevant measures.

(2) Qualitative data will be obtained from focus groups separately of each of veterans, family members and clinicians at the end of the intervention.

A focus group was conducted for the first MFG in Durham in August 2010. The tape recorded dialogue from this focus group were transcribed. Several attempts were made to schedule a focus group from the first MFG in the Bronx, but on each occasion, only one family attended, reflecting a general drop-off in attendance in this group after the first 6 months. In lieu of a focus group, clinical notes of the reactions of each couple to the MFG were made

Key Research Accomplishments

- **Recruitment of MFG clinicians willing to donate time at 2 sites**
- **Recruitment and processing of appointments for Research Assistants at 2 sites**
- **Submission and approval of research protocol to IRB and R & D committees at the Bronx VAMC and Durham**
- **Review and refinement of assessment protocol**
- **Submission and approval for amendments to IRB protocol to add new, relevant research measures, new staff, and increased enrollment in the Bronx**
- **Organizing and conducting 2-day training workshop in MFGT with expert consultants Dennis Dyck and Diane Norrell in the Bronx, NY. Attendees from Durham.**
- **Development of recruitment channels, including liaising with multiple services and providers at 2 sites.**
- **Development of recruitment and participant tracking database and reports in Access (consultant hours subsidized by VISN 3 MIRECC)**
- **Recruitment and consenting of 19 veterans and 19 family members to date**
- **Baseline assessment of 19 veterans and 19 family members to date**
- **Modification of Joining Sessions and Educational Workshop to meet needs of OIF-OEF veterans and family members**
- **Weekly administrative and supervisory meeting (2 meetings/week)**
- **Conduct Joining sessions for xx families 4 groups)**
- **Conduct Educational workshop for xx families (4 groups)**
- **Adherence ratings**

- **Completion of the first MFG in Bronx and the first MFG in Durham**
- **Initiation and continuation of second MFG in Durham**
- **Data presentation at the 2010 National VA Mental Health Conference and the 2010 American Psychological Association Conference**
- **Paper provisionally accepted for *Professional Psychology: Research and Practice***

Reportable Outcomes

Reportable outcomes to date are minimal, as only two groups have been completed. Nonetheless descriptions of the study and baseline data were accepted for presentation at conferences as noted below.

Straits-Troster, K, Perlick, D.A. Kline, A., Norell, D., Dyck, D. & J. Strauss.
Adaptation of multi-family group treatment for Veterans with traumatic brain injury and their families. Poster presented at the International Society for Traumatic Stress Studies 25th annual meeting, Atlanta, GA. (Nov. 2009) (Abstract appended in previous report)

Perlick, D., Cristian, A., Straits Troster, K., Kline, A. (Aug 2009). *Multifamily group intervention for OIF/OEF traumatic brain injury survivors and their family members.* Poster accepted for presentation at Military Health Research Forum (MHRF), Kansas City, MO. (Materials appended in prior report)

Perlick, D.A., Straits-Troster, K, Dyck, D., Norell, D., Strauss, J.L., Henderson, C., Close, J., Berger, N., Bonuck, E., Taber, K.H., Calvin, D., Dolber, T., Cristian, A. *Multifamily group treatment for veterans with traumatic brain injury.* Professional Psychology: Research and Practice, (provisionally accepted pending receipt and processing of COI and authorship right forms). (Paper appended).

Perlick, D.A., Straits-Troster, K., Cristian, A.. (July 2010). *Multifamily group intervention for OIF/OEF traumatic brain injury survivors and their family members.* Paper presented at the VHA Mental Health Conference, Baltimore, MD, July, 2010. (Presentation appended).

Perlick, D.A., Straits-Troster, K, Norell, D., Close, J., Berger, N., Bonuck, E., Taber, K.H., Calvin, D., Dolber, T., Cristian, A, Dyck, D. (August 2010). *Adaptation of multifamily group Treatment for Veterans with traumatic brain injury and their families.* Paper presented at the American Psychological Association Meeting, San Diego, CA., August 2010. (Abstract appended).

Conclusion

The major results to date relate to the composition of the two MFGT's which helps us evaluate the characteristics of veterans and families that agree to participate in this relatively long-term treatment. We discuss first, characteristics of veterans that are comparable for the Bronx and Durham, then those which differ to some degree between sites, though not significantly as the numbers are too small to evaluate statistical significance. We then discuss characteristics of family members using the same format.

Veterans-Sociodemographic Characteristics: Overall (see Table 1-appendices), veterans are in their early to mid 30's and are all male. Most (8/9) are currently married or cohabiting or were married in the past and have had 2-3 deployments. However veterans from the Bronx are more ethnically diverse than those from Durham, with only 20% Caucasian vs. 100% from Durham. Vets from Durham are also more often working: 100% are employed FT or PT vs. only 20% in the Bronx. Differences in employment status may be explained by a longer time since last deployment in DVAMC (4 years in Durham vs. 1 in the Bronx) and a higher level of education in Durham (75 vs. 20% have some education beyond grade 12).

Veterans—Clinical and Coping: With respect to clinical and affective/coping characteristics, all vets from both sites were well above the cut-off score of 16 on the CES-D (depressive symptoms) scale and also above the more conservative cut-off of 20. Somewhat surprisingly, none of the BVAMC and only 50% of the DVAMC vets met criteria for a mood disorder on the PHQ. All vets screened negative for suicide risk on the CSS-RS. About 80% of the sample scored positive for PTSD on the PCL, but only a minority (20-25%) met criteria for anxiety disorder on the PHQ. More vets from Durham screened positive for ETOH abuse than in the Bronx (75% vs. 0%). In terms of anger, vets in both samples reported between .5 to 1.0 s.d. more suppressed anger and less attempt at anger control than college students. In terms of expressed anger, Durham vets as a group reported expressing over 1 s.d. more anger than college students, while Bronx vets reported displaying somewhat less as a group.

Veterans-Neurocognitive Status: Although vets at both sites scored well above the cut-off of 20 on the Mini-mental status exam, vets in the Bronx displayed more signs of cognitive impairment, perhaps related to their shorter latency to the last deployment. On a list learning and recognition memory task (CVLT), Bronx vets scored between 1 and 1.5 s.d.'s below the mean on most measures whereas Durham vets scored less than .5 s.d. below the mean. The difference was most striking for recognition memory where Bronx vets scored 3 s.d.'s below the mean vs. .38 below for Durham vets. Similarly, on both Trails A and B, which assesses speed of processing, Bronx vets scored in the moderately impaired range whereas Durham vets scored within normal limits. On the WAIS II, vets from both sites performed within normal limits (i.e. within 1 s.d. of the mean) on the Similarities and Number-letter sequencing subtests, but Bronx vets performed about 2 s.d. below the mean of the Digit Symbol subtest.

Family Members-Sociodemographic Characteristics: Most family members at both sites were in their early 30's, were female and lived with the veteran. In the Bronx, 80% were partners or spouses and one was a sister. In Durham half were partners, with one sibling and one daughter. At both sites close to half were employed full or part-time. Ethnicity was consistent with that reported for veterans above. In the Bronx, family members were more frequently educated past 12th grade than veterans, while in Durham family members were less often educated beyond 12th grade than veterans.

Family Members—Clinical and Coping: Family members at both sites reported burden scores above the mean for a sample of family members of patients diagnosed with Alzheimer's disease. Family members in the Bronx reported less suppressed anger and more expressed anger than both the normative sample and than family members in Durham, by about 1 s.d., however families at both sites reported equal attempts to control anger as that reported by the normative sample. 40% of families in the Bronx and 75% in Durham reported CES-D scores above the cut-off for depression, however the total CES-D score in Durham was more than twice as much as the mean score in the Bronx which was below the cut-off. However no caregiver at either site screened positive for suicide risk. In the Bronx no caregiver screened positive for a mood or anxiety disorder or etoh abuse on the PHQ, while about two-thirds in Durham reported mood or anxiety disorders and one-third screened positive for etoh abuse. Overall, family members in Durham reported a somewhat higher level of psychological distress than those in the Bronx, while both were equally burdened.

In summary, our results to date demonstrate: 1) It is feasible if challenging to engage OIF/OEF veterans with TBI in a multi-family group; 2) veterans and family members both report significant symptoms of distress and difficulties coping that can be productively addressed using the problem-solving methodology of the MFGT; 3) The contents of the intervention need to be modified to address the needs of combat veterans and conjugal couples.

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Appendix 1 : Data

Table 1: Demographic and Clinical Characteristics

Demographic Variables	Veterans (N=19) %(N) or Mean \pm SD	Family Members (N=19) %(N) or Mean \pm SD
Age (years)		
Gender	35.6 \pm 9.2	35.0 \pm 12.4
Male	86.7	6.7
Female	0 (0)	0 (0)
Ethnicity		
African-American	33.3 (5)	20.0 (3)
Caucasian	46.7 (7)	46.7 (7)
Hispanic	20.0 (3)	33.3 (5)
Marital status		
Married/cohabitating	60.0 (9)	73.3 (11)
Employment status		
Full Time	33.3 (5)	40.0 (6)
Part time	20.0 (3)	13.3 (2)
Unemployed/ Disability	40.0 (6)	33.3 (5)
Student	6.7 (1)	13.3 (2)
Highest grade attained		
12	46.7 (7)	40.0 (6)
Post 12	53.3 (8)	60.0 (9)

<i>Clinical Variables</i>	Veterans (N=19) %(N) or Mean \pm SD	Family Members (N=19) %(N) or Mean \pm SD
AX Anger Management*	34.9 \pm 16.1	26.8 \pm 5.4
CESD (Depression) score*	24.9 \pm 12.1	23.8 \pm 15.3
SF-36 General Health*	2.7 \pm 1.4	2.5 \pm 1.0
Caregiver Burden*	N/A	34.4 \pm 20.2
Family Empowerment**	N/A	39.5 \pm 4.6

*Higher scores reflect poorer adjustment

** Higher scores reflect better adjustment

Table 2: Veteran Follow Up Data

Variable	Baseline	3 months	6 months
CESD Depression Scale*	24.9 ± 12.1	29.1 ± 8.1	26.1 ± 13.8
AX Anger Management*	34.9 ± 16.1	36.0 ± 15.0	31.1 ± 13.6
SF-36 General Health*	2.7 ± 1.4	3.1 ± 1.1	3.1 ± 1.3

*Higher scores reflect poorer adjustment

** Higher scores reflect better adjustment

Table 3: Caregiver Follow Up Data

Variable	Baseline	3 months	6 months
CESD Depression Scale*	23.8 ± 15.3	10.2 ± 7. 4	16.3 ± 15.0
Caregiver Burden*	34.4 ± 20.2	26.0 ± 17.5	30.0 ± 30.0
SF-36 General Health*	2.5 ± 1.0	2.3 ± 1.2	2.5 ± 1.3
Family Empowerment**	39.5 ± 4.6	43.3 ± 10.4	47.8 ± 6.7

*Higher scores reflect poorer adjustment

** Higher scores reflect better adjustment

5275 words, 2 tables, 0 figures

**MULTI-FAMILY GROUP TREATMENT FOR VETERANS
WITH TRAUMATIC BRAIN INJURY**

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A common clinical problem encountered by clinicians treating veterans who incurred traumatic brain injury (TBI) while serving in Afghanistan in support of Operation Enduring Freedom (OEF) or in Iraq in support of Operation Iraqi Freedom (OIF) is lack of knowledge about TBI on the part of the veterans' family members. Insufficient information can exacerbate marital or family conflict and lead to psychological distress and social isolation for the veteran and family, and suboptimal illness management for the veteran. To address this problem, we adapted Multi-Family Group Treatment (MFGT), an evidence-based practice for treatment of serious mental illness (SMI), for treatment of OEF/OIF veterans with TBI and their families. We have implemented the adapted treatment (MFG-TBI) in four groups of veterans and families (N=20 veterans and 20 family members) across two sites: the Durham VA Medical Center (VAMC) in North Carolina and the JJ Peters VAMC in the Bronx, New York. Adaptations focused on contents and format of the educational components, specification of a protocol for conjugal couples and addition of an ecomap to identify support systems during the Joining (i.e. assessment) phase, a shorter (nine months) intervention duration and a more active clinician role including use of motivational enhancement, intersession support and coordination with other service providers. Bi-weekly group sessions were supervised and rated for adherence. We illustrate how MFG-TBI both educates and

builds problem-solving skills with clinical examples. Suggestions for effective use of problem-solving skills with this population are offered.

Traumatic brain injury, an injury or concussion associated with brief loss of consciousness or altered mental state, has been termed a “signature” injury of the ongoing military operations in Iraq and Afghanistan since 2001 (Hoge, McGurk, Thomas, Cox, Engel et al., 2008). At least 22% of soldiers wounded in Afghanistan in support of Operation Enduring Freedom (OEF) and in Iraq in support of Operation Iraqi Freedom (OIF) are estimated to have traumatic brain injury (TBI); the actual incidence may be even higher due to delayed diagnosis of milder cases of closed head injury (Okie, 2005). Complicating the recovery of this cohort is a high degree of comorbidity: A recent study found that 71% of OEF/OIF veterans reporting loss of consciousness or altered mental state had comorbid post-traumatic stress disorder (PTSD) (Hoge et al, 2008), and comorbid depression and other mental health conditions are also common (Cohen, Gima, Bertenthal, Kim, Marmar, et al., 2009). Thus, veterans surviving a TBI face a variety of physical, cognitive, behavioral, personality and emotional problems, with consequent barriers to productive living and community reintegration (Hoge et al., 2008; Lew, Poole, Guillory, Salerno, Leskin, et al., 2006).

The sequelae of TBI affect not only survivors; these injuries may have a dramatic impact on the lives of veterans’ spouses, parents and children who must confront and learn to cope with long-lasting changes to family life and roles within the family. Yet, family members frequently lack important information about the veteran’s condition, prognosis, treatment and home assistance needs, contributing to misguided expectations,

disappointment, frustration, family conflict and child distress (Collins & Kennedy, 2008, Cozza, Guimond, McKibben, Chun, Arata-Maiers, et al., 2010). Programs to support and involve family members early in the service members' recovery are available for families of more severely injured individuals, who may be transferred to Walter Reed Army Medical Center (WRAMC) for treatment and rehabilitation following medical evacuation from trauma centers in Baghdad, Iraq and Lundstuhl, Germany. However, when the service member is discharged and returns home, the local Veterans Administration Medical Center (VAMC) may be equipped with fewer resources for rehabilitation, and family members may experience a sharp contrast in their engagement with their veteran's treatment. Family resources and education about TBI and care management may not be available for less severely injured individuals not requiring medical evacuation or those who were diagnosed with TBI after their separation from military service. Thus, in many cases, there is a gap between the needs of veterans and their families for family education and support, and the continued availability of such services within the current Department of Defense and Veteran's Administration continuum of care. Because informed support and encouragement by family members are critical to the veteran's reintegration into civilian life, and family discord has been associated with poor therapeutic alliance and lower rates of return to productivity (Sherer, Evans, Leverenz, Stouter, Irby, et al., 2007), this is a critical gap to fill.

This paper describes our initial experience with an intervention model we have developed to bridge this potential gap in services. The intervention, Multi-Family Group Treatment for TBI (MFG-TBI), is an adaptation of a family and evidence-based model for the treatment of serious mental illness (SMI) emphasizing education and problem-

solving (McFarlane, 2002), currently being implemented and evaluated at two VAMC's: the JJ Peters VAMC in the Bronx, NY, and the Durham VAMC in NC. Like veterans and veterans' families with SMI, veterans with TBI and their families have many needs that can be addressed with a problem-solving approach. But there are also important differences between these two groups, requiring some adaptations to, or further specifications of the original model. In this paper we will describe some of these differences and how they have informed our adaptation of the model.

Multi-Family Group: Original Model for Treatment of Serious Mental Illness

Multi-Family Group Treatment (MFGT or MFG) treatment is a psycho-educational management strategy originally developed by William McFarlane to assist families and mental health care consumers with schizophrenia to improve their coping, illness management, and relapse prevention skills (McFarlane, 2002). Clinicians work with 6-8 consumers together with their family members using an interactive, structured approach centered around solving everyday problems the members experience. The treatment consists of three sequential phases: 1) "Joining" in which the clinicians meets with each individual family for 2-3 sessions; 2) An Educational Workshop which provides information about the illness and group treatment model to all consumers and families; 3) bi-weekly Group Meetings for all families for 12 months. MFG has been rigorously tested in the management of consumers with schizophrenia and found to be effective in managing symptoms of SMI, reducing adverse events (hospitalizations, relapse) and improving functioning (Dyck, Short, Hendryx, Norell, Myers, et al., 2000; Dyck, Hendryx, Short, Voss, & McFarlane, 2002; McFarlane, 2002), as well as reducing

caregiver distress and improving health outcomes for consumers and families (Hazel, McDonell, Short, Berry, Voss, et al., 2004; McDonell, Short, Berry, & Dyck, 2003).

Adaptation of Model for Traumatic Brain Injury

More recently, Dyck, Becker and colleagues adapted the MFG intervention for civilians surviving a TBI (i.e., civilian survivors), retaining the structure and format of MFG for SMI, but modifying the contents. Preliminary results for 14 civilian survivors and family members showed decreased reports of depressive symptoms, anger expression and increased life satisfaction for survivors, and reduced burden for family members (Rodgers, Strode, Norell, Short, Dyck, et al, 2007). These findings suggested that MFG could benefit veterans with TBI and their family members, and comprised the basis for further adapting the original MFG model to the treatment of OEF/OIF combat veterans with TBI. Sherman and colleagues reported very good participation, retention and program satisfaction rates for an adaptation of MFG for veterans with PTSD and mood disorders and their families, “Reaching out to Educate and Assist Caring, Healthy Families (REACH)”, suggesting the basic MFG model is acceptable to and addresses needs of veterans and veteran families (Sherman, Fischer, Sorocco and McFarlane, 2009). In adapting the MFG model for military TBI sustained during active combat, we considered the following key differences between our cohort of combat veterans and the original SMI population: differences in the onset of the illness/injury (relatively acute, traumatic onset during adulthood vs. more gradual onset during adolescence), context of the illness/injury (active combat vs. civilian life) and common comorbidities (multiple mental health and medical comorbidities vs. a more limited range), differences in the relationship of the family member participant to the affected individual (predominantly

spouses vs. predominantly parents for SMI), and differences in ethnicity and sociodemographic status a greater proportion of ethnic and racial minorities vs. a more representative sample for SMI). The often acute, traumatic nature of the TBI, and associated cognitive limitations and comorbidities have posed special challenges to engagement and retention of group participants, together with acute functional problems (e.g., housing transitions), developmental issues (pregnancy, child care), and financial problems characteristic of this predominantly younger, more ethnically diverse and socioeconomically challenged cohort of veterans. The military experience and its impact on the family as a whole have influenced the contents and structure of the educational workshop, while the predominance of conjugal couples in our sample and in the larger OEF/OIF cohort with TBI has suggested changes in the Joining sessions that incorporate basic techniques and practices common to most couples' interventions towards repairing and preserving the marital relationship and addressing parenting concerns. Due to the high comorbidity between TBI and PTSD, and the extensive PTSD literature on family impact and intervention, we have drawn from this literature as well as from the TBI literature.

In the remainder of this paper we describe specific adaptations to the original MFG model and the rationale for each adaptation, beginning with treatment engagement and proceeding with each treatment component (i.e., Joining, Workshop and Group sessions) in the sequence in which they occur in both the original and our adapted model. For convenience, the adaptations are summarized in Table 1.

[insert Table 1 about here]

Treatment engagement. Although not a formal component of the MFG model, we include it here because engagement of combat veterans in mental health treatment has been acknowledged to present special challenges, requiring an expanded repertoire of therapeutic skills. Elucidation of the barriers to engagement of veterans and veterans' families in mental health services in general and among veterans who served in Vietnam and in Iraq or Afghanistan in particular, has been the focus of recent qualitative research (e.g., Sherman, Blevins, Kirchner, Ridener, & Jackson, 2008; Straits-Tröester, Gierisch, Calhoun, Strauss, Voils, et al., in press), as well as large-scale surveys (Eaton, Hoge, Messer, Whitt, Cabrera, et al., 2008; Hoge, Castro, Messer, McGurk, & Koffman, 2004). Both logistical (e.g., work schedules, difficulty scheduling appointments, child care problems, money for transportation or parking, confusion about benefits, distance from hospital, unawareness of available services) and attitudinal/emotional barriers (lack of recognition of problems, hopelessness/resignation, fear of worsening problem, concerns about privacy/confidentiality, stigma concerns, self-help ethic, and feeling “overwhelmed” by the transition back to civilian life) have been identified.

While overall these barriers to family participation in mental health treatment are not unique to OEF/OIF veterans with TBI, our experience suggests that two may present particular obstacles to engagement and/or retention for our cohort. The experience of being too overwhelmed to seek out mental health care, particularly specialized services such as family psychoeducation, is consistent with our clinical observations that our cohort does indeed bear an enormous burden in coordinating their health care, which may include appointments with the polytrauma physician, mental health care (including treatment for PTSD and/or depression), speech therapy, vocational counseling or

rehabilitation, acupuncture (for pain), and general medical appointments, with childcare and work and/or school schedules. In addition, OEF/OIF veterans frequently have to cope with acute psychosocial difficulties, such as loss of housing, legal complications and so forth. Given that TBI often compromises organizational abilities and memory, fitting the MFG into their schedules and remembering appointments, particularly during the engagement or Joining phase, represents a true challenge.

Second, while mental illness stigma has clearly been identified as a barrier to care for consumers with SMI (e.g., Perlick, 2001; U.S. Department of Health and Human Services, 1999), for prospective MFG participants in the National Guard or Reserves who may contemplate return to combat, stigma may represent an even larger disincentive, as use of mental health services may adversely affect chances of promotion (Straits-Tröester, et.al., in press). Hoge et al. (2004) reported that soldiers who screened positive for a mental disorder were at least twice as likely to report concerns about being stigmatized as those who did not, and only 23-40% actually sought mental health care. Veterans with TBI may also avoid mental health treatment due to concerns about exposing cognitive deficits, particularly in a group setting and/or due comorbid PTSD symptom of emotional numbing and avoidance (Sherman et al., 2008). Given the realistic concerns about repercussions of mental health service use on military career, the relative acuteness of the TBI and the frequency of comorbid PTSD, participation in the MFG may be perceived as more threatening and stigmatizing to veterans with TBI than a multi-family group for individuals with SMI.

While there is no perfect solution to address the barriers described above, clinicians can take some proactive steps to increase engagement and reduce premature termination.

The MFG clinician serving as a liaison to primary mental health or rehab providers can be helpful in tailoring a schedule that is more do-able for the veteran and accommodates participation in the MFG. This is consistent with the original MFG model but in the TBI cohort more activity in this role is needed. To address stigma concerns, the therapist can help inoculate participants against stigma concerns from the outset by raising them in the context of a motivational interviewing (MI - Miller & Rollnick, 2002) paradigm, where the therapist, veteran and family member explore the pros and cons of engaging in the treatment and “change talk” is elicited. The MI paradigm would also be useful in examining and reconciling the logistical difficulties discussed above. Against the ‘cons’ of stigma and scheduling would be the pros of group and therapist support, learning problem-solving skills, and learning that other veterans and family members share common difficulties. Based on a recent interview study, Sherman et al. (2008) reported that veterans and partners tend to consider a “decisional balance” between the perceived benefits of participation in family services and the perceived barriers. Thus MI may tap into and help consolidate the results of an ongoing process. MFG clinicians can also help participants to formulate stigma concerns as problems that can be addressed during problem-solving. Finally, it may help to emphasize that the MFG is a problem-solving rather than a trauma-focused intervention, thus reducing some of the anxiety both veterans and family members may experience about coming to a group with other injured veterans.

Joining Sessions. *Ecomap of support network.* In the original MFG model, a genogram is used to identify family members in multiple generations some of whom have most likely had an SMI. This is helpful in beginning to educate family members about the

genetic, biological nature of mental illness with respect to their own families. We added an ecomap also referred to as a sociogram (Hartman, 1978). Like the genogram, the ecomap is a visual tool, but it differs from the genogram in that it looks beyond the individual and his/her family to depict the relationships between the individual or family and his/her social network (Hartman, 1978). It provides information regarding the family's social network size, diversity, stability and available resources. In constructing an ecomap the identified individual is placed in a center circle and lines are drawn from the center to outer circles representing other individuals, faith communities or other organizations with whom the individual interacts, with a solid line describing a strong, positive relationship, and a broken one describing a more tenuous relationship. This method helps the family and clinician to evaluate the strengths and challenges in the social environment and to identify where additional supports may be needed. Our veterans, whose deployments and/or PTSD symptoms had often resulted in disrupted ties, found this to be a useful diagnostic and treatment planning tool.

Specifications for conjugal couples. In our small study cohort, 56% of Durham participants and 100% of Bronx participants were married or cohabiting. These numbers are consistent with those reported by Hoge and colleagues: in their study of 2525 U.S. Army soldiers returning from Iraq with mild TBI, 61-62% were married (Hoge et al., 2008). While it is important to recognize that OEF/OIF veterans with TBI present for treatment with varied family constellations, we also recognize that the original MFG model was not developed to address the needs of conjugal couples where one member has a serious neurobehavioral disorder. Historically, clinicians have adapted established, general treatment models for specific work with couples and/or combat veterans. For

example, in the post-Vietnam era, established family intervention models such as Behavioral Family Therapy (BFT - Mueser & Glynn, 1999) and Integrative Behavioral Couple Therapy (IBCT - Jacobson & Christensen, 1996) were adapted to meet the unique needs and problems of couples with a member affected by PTSD (e.g., Integrative Behavioral Couple Therapy for Posttraumatic Stress Disorder- Erbes, Polusny, MacDermid, & Compton, 2008; Adjunctive Behavioral Family Therapy-Glynn, Eth, Randolph, Foy, Urbaitis, et al., 1999). While these models differ in theoretical orientation and practice, implicit in all is a recognition that the symptoms of PTSD are disruptive to marital relationships (e.g., Sherman et al., 2008). Veterans suffering from PTSD are at increased risk for divorce, consideration of divorce, decreased couples' satisfaction and increased difficulties with childrearing (Galovski & Lyons, 2004). Recent studies of OEF/OIF veterans and other cohorts with TBI have also underscored the neurobehavioral, emotional and personality changes associated with TBI on family burden and coping, which are particularly pronounced among spouses, as compared to parents (e.g., Collins & Kennedy, 2008; Kreutzer, Gervasio, & Camplair, 1994).

A major focus in work with conjugal couples who have become emotionally detached is to foster re-establishment of emotional and physical intimacy and interdependence (Erbes et al., 2008; Monson, Fredman & Adair, 2008). To achieve this goal for couples within the context of the MFG, we have specified a protocol for couples entering the MFG that maps onto the standard MFG Joining protocol and additionally incorporates three basic 'generic' cornerstones of couples interventions: education, skills training, and conveying a formulation of the prototypical behavioral patterns and feelings that maintain the couple's distress. *Education.* In keeping with recommendations of

Erbes et al. (2008), we begin the treatment with education aimed at engaging couples who are often emotionally disconnected. Three basic areas are covered. First, the couples' distress, conflict, and difficulties functioning as a couple in parenting, financial planning, intimate relations, etc. are normalized as being common problems that many couples in their situation share: The clinician helps the couple to cognitively reframe their problems in relation to the military experience, the strains of separation, coping with the TBI/PTSD and difficulties in constructing a new life that respects and accommodates all of the above (Collins & Kennedy, 2008). Second, the therapist strives to counter negative thinking and pessimism related to the depressive symptoms that frequently characterize both veterans and family members (Eaton et al, 2008; Hoge et al., 2004) through education about the health benefits of positive, and potential harm of negative thinking, including perpetuating symptoms of depression (Kreutzer, Marwitz, Godwin, & Arango-Lasprilla, in press). It is useful to emphasize that the MFG promotes positive thinking because it is focused on solving problems. Third, assuming that PTSD is present, the therapist educates the couple about the ways in which the avoidance and emotional numbing aspects of the disorder can negatively impact the relationship (Sherman, Zanotti, & Jones, 2005).

Skills Training. The second component to the MFG couples' Joining protocol is introduction of a skill or tool the couple can use to begin to counteract the threats to the relationship posed by conflict, avoidance and depression. Our experience is consistent with recommendations by Monson et al. (2008) that it is important for the therapist to begin to reduce negative relationship behavior as quickly as possible. The therapist tailors the particular skill to the particular couple's needs. Demonstration of problem-solving

gives couples a 'preview' of and helps prepare them for the group work, while provision of such communication training (CT) skills as giving positive feedback, making positive requests, and expressing negative feelings, (Mueser & Glynn, 1999) can help lay the foundation for constructive problem-solving in the MFG, particularly where avoidant behavior and emotional disengagement are high. When one couple opened a Joining session stating they were not speaking to one another, after a brief inquiry (i.e., to assess for domestic partner violence or major life event) and subsequent normalization of marital conflict for OEF/OIF veterans and spouses, the therapist introduced CT. Participation in this exercise enable this estranged couple to give positive feedback to one another while making eye contact. To their surprise they discovered they were pleased by actions the other member had taken during the past week. In this instance, use of CT offered a fast-acting inroad to undermine a cycle of negative communication. In contrast, an early couple whose multiple conflicts were not addressed in Joining began to argue during an analysis of the couple's strengths and weaknesses to the point where one member left the room and seldom participated in group sessions.

Formulation. The third component to the MFG couples' Joining protocol is the delivery of a basic, behavioral formulation of how the couple functions (i.e. the strengths and weaknesses of the relationship), the major areas of conflict, and how they can benefit from the MFG. Here it may be useful to introduce the concept of emotional acceptance (Erbes et al, 2008). To do so, the therapist suggests that the couple can begin to move towards attaining their relationship goals by accepting and trying to understand their partner's perspective, rather than by criticizing and insisting that the partner make behavioral changes that he/she may not equipped to make at present. This can be done

either explicitly, and/or more implicitly, through educating each member about the unique challenges and difficulties experienced by the other. In our experience many family members do not possess a basic understanding of the symptoms of TBI or PTSD and therefore tend to personalize them (Sherman et al., 2005), while many veterans have a relatively limited appreciation of the difficulties their partner has endured during the couple's separation and of his/her resulting needs and frustrations. Acceptance facilitated by explicating and validating both partners' perspectives can help to break a negative relationship stalemate. Coupled with skill acquisition (e.g., positive behavioral exchange through communication training or problem-solving), it can begin to alter the emotional climate of the relationship and facilitate attendance and participation in group problem-solving. As Sherman et al. (2005) point out, "enhancing partner acceptance is powerful and often results in behavioral change." Finally, the therapist also asks the couple to evaluate and affirm their commitment to working on the relationship in the MFG. It should be noted that some components of the protocol described for couples (e.g., early education, introduction of a skill) may be useful to veteran/family member dyads that are not a couple, especially where symptoms are acute and/or the conflict level is high.

Educational Workshop. The workshop was modified in both format and contents.

Format. In order to minimize information overload for individuals with memory problems and to accommodate the busy schedules of the veterans and their families, the Workshop was divided up over two weekday evenings, rather than adhering to the original one-day format. **Contents.** The workshop materials used by Dyck in his civilian TBI study were modified to include information on the military experience, the pathophysiology and treatment of TBI associated with blast injury and comorbid

conditions. To help deliver this information, local experts were enlisted to give presentations on brain functions/dysfunctions and basic neuroanatomy, TBI related to improvised explosive devices and motor vehicle accidents and associated functional limitations and PTSD. In addition, the workshop slides were customized to allow for easy viewing by cognitively impaired individuals. This included reduction of the amount of material presented on each slide, use of high contrast typeface/background, insertion of color images to facilitate attention/concentration, and distribution of color handouts of the presentation for reference. The contents of the Workshop are summarized in Table 2.

[Insert Table 2 about here]

To reinforce and supplement the material presented at the Workshop, participants were given handouts, including summary pamphlets, posters summarizing the MFG structure and brochures on community resources.

Group meetings. The overall structure of group meetings followed the prescribed sequence of the original model, beginning with a brief socialization period, proceeding to a check-in with each family, followed by problem formulation, solving and planning, and ending with another brief socialization. The problems identified by veterans and family members clustered into three areas: 1) Family and relationship issues (e.g., reduced or poor communication, parenting conflicts, and partner frustration with behavior related to the veterans' cognitive deficits and symptoms of PTSD or depression); 2) Veterans' problems related to cognitive deficits or mental disorders (e.g., losing or misplacing important items, forgetting to take medications, trouble setting goals or planning realistically); 3) Veteran self-identity and community interface (e.g., difficulty accepting limitations, difficulty negotiating work or school accommodations).

Challenges observed with conducting group meetings with this cohort included lack of carry-over of educational material from the workshop to the group sessions for use in problem-solving, difficulty adhering to the structured group format outlined above, particularly for more cognitively impaired individuals, and difficulties with emotion regulation following or during group sessions. In some groups, the check-in with each family was complicated by occasional perseveration by veterans, expression of intense family tensions and/or introduction of acute problems, e.g., homelessness. Several measures were taken to enhance carry-over of material presented in the Workshop to the group sessions. A color-printed binder of the slides was distributed to each group member. To further enhance understanding of the problems reported by veterans and family members problems in relation to the military experience, TBI and comorbid conditions, the MFG clinicians brought in additional educational material related to specific problems raised by group members. For example, we distributed “Communication for Couples: Tips for Military Members and Their Families” after a problem-solving session which focused on communication difficulties. At times, active redirection was required by MFG clinicians to maintain the problem-solving format of the group when more impaired individuals lost track of the task at hand, including asking one member to step out of the room for an individual discussion. However, even groups experiencing initial difficulties in working within the model were able to learn and use the problem-solving format more productively over time. For example, to address a veteran’s problem identified as “Remember to order prescription refills”, the group generated a solution including: 1) Use multiple reminders, such as a white board; 2) Use the “snooze” or “later” option when dismissing PDA reminders, and 3) Use a pillbox. In

a subsequent session the veteran reported no longer dismissing PDA reminders and using the whiteboard for other reminders. Problem-solving was used to address family members' needs as well. For example, to address the problem, "Improve self-care when dealing with work stress and partner's moods" the group recommended the family member: 1) Engage in physical activity outdoors (e.g., cut wood); 2) Post a sign saying, "I am out for private time". The family member reported feeling better and losing weight as a result of cutting wood.

Some group members required additional support between group sessions to be able to participate. For example, one family member noted that her partner became agitated and grandiose after sessions. This veteran tended to use avoidant coping strategies (e.g., wishful thinking) to cope with the challenges of rehabilitation, and these were undercut by the problem-focused orientation of the group, leaving him feeling exposed and vulnerable. Separate, individual sessions for the veteran and his partner were required to address this, which then allowed the couple to return to the group. For conjugal couples presenting with high conflict, adjunctive couples sessions were sometimes used to address highly charged or conflictual issues that could not be optimally handled within the group, or that were deemed disruptive to group problem-solving. In other cases, individual couples' sessions were employed when recommended as a solution to a couples-focused problem, e.g. communication re: parenting.

While from a traditional group therapy perspective, working with group members outside of the group might be viewed as diluting the effectiveness of the group work, in our clinical experience with this model to date, used judiciously they both facilitated and enhanced the group experience. When individual couples sessions were scheduled it was

done with the knowledge and/or endorsement of the group and the purpose of the session (e.g., to negotiate more effective procedures for communication about childcare), and outcomes (fewer ‘missed calls’, arguments) were discussed with the group. Using this approach the individual couples sessions served as an extension of the group work, rather than as a separate venue which took important issues outside of the group domain.

Finally, to facilitate consolidation of learning during the intervention and reinforce the positive efforts of the participants, the clinicians led the group in a structured summary exercise where the different coping strategies the group members had learned and implemented from problem-solving exercises were written on a white board. This provided a forum for the group members to give positive feedback to one another.

Summary, future directions and implications for clinical work

Multi-family group treatment for SMI is a widely used intervention with a well-established evidence base. It offers a supportive environment in which families and mental health consumers can come together and learn a new approach for addressing their everyday problems of living. We have adapted this model to be responsive to the needs of OEF/OIF veterans with TBI and comorbid conditions and their families. Table 2 summarizes the adaptations and additions we have made to the SMI model to date, as discussed above. It should be emphasized that, given the substantial evidence base for the original model, few of these changes were initiated at the outset of the study. Rather, our approach in this treatment development study has been to assess the clients’ needs and implement changes on an ongoing yet systematic basis (i.e. through discussion with the study investigators, clinicians and MFG supervisor) that is responsive to clinical need. We are currently manualizing the changes we have implemented so that the adapted

model can be systematically implemented and evaluated in subsequent trials. Although the demographics and needs of these veterans and family members differ from those in the original SMI studies, initial clinical anecdotal evidence suggests that the basic problem-solving model can be helpful to OEF/OIF veterans and families with relatively minor yet important modifications to accommodate their needs, deficits and life situations. As this study was designed as a feasibility/demonstration project, we are assessing change in veteran and family member distress and clinical symptoms, functioning and coping strategies over the course of and post-intervention using standard psychometric measures; these data will be reported separately. Our experience with this model to date suggests that clinicians working with OEF/OIF veterans and family members might consider the following points:

- 1) The value of teaching and practicing *problem solving skills* with this population. The frequent transitions and adjustments in relation to work, school, parenthood and other significant life events experienced by this cohort, occurring in the context of cognitive impairments and separation from the military, can overwhelm and deplete coping resources. The systematic practice of problem-solving provides veterans and family members with a skill set that promotes adaptation and greater effectiveness in negotiating these transitions.
- 2) The importance of *repetition* from multiple sources over multiple timepoints, including review of material from prior sessions, and provision of educational handouts to ensure learning and transfer of training beyond the treatment setting.
- 3) The importance of *assessing and addressing* factors that may interfere with learning problem-solving (e.g., agitation/disinhibition, marital/relationship conflict).

4) The value of using *positive feedback* to reinforce finding solutions to problems and implementation of solutions, to model the use of positive feedback, and empower veterans and family members.

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Table 1: Adaptations for Multifamily Group for Veterans with Traumatic Brain Injury

MFG Component	Adaptations
Engagement	<ul style="list-style-type: none"> · Engagement--Motivational enhancement, stigma reduction · Liaison--More active liaison with other service providers
Joining Sessions	<ul style="list-style-type: none"> · Joining aids – Inclusion of ecomap of support network · Specifications for conjugal couples <ul style="list-style-type: none"> - Pre-workshop education (normalization of marital conflict/distress, health benefits/costs of positive vs. negative thinking, acceptance, negative impact of PTSD) - Introduction of skill tailored to couple's situation - Formulation: couples' functioning, goals, commitment contract
Educational Workshop	<ul style="list-style-type: none"> · Format – Delivery of materials spans two sessions · Contents – Education on TBI and comorbid conditions (e.g. PTSD) <ul style="list-style-type: none"> - Diagnosis, pathophysiology, treatment and impact - Visual enhancement of slide presentation - Presentation reinforced with handouts

DAY 1: TBI: Psychoeducation on TBI and its Treatment	<ul style="list-style-type: none">· Pathophysiology: TBI is sustained from focal, diffuse axonal or blast injuries· Symptoms: Headache, dizziness, tinnitus, insomnia, apathy, problems with memory, attention/concentration, balance/vision, emotion regulation· Social Sequelae: Difficulty following, recalling conversations, interpreting nonverbal cues, modulating verbal expression· Treatment: Use of medication, speech, physical and behavioral therapies, compensatory strategies	
Group Sessions	<ul style="list-style-type: none">· Multimodal reminders – distribution of meeting schedule, placement of reminder calls, aid with PDA entry· Intersession support—individual family sessions as needed· Relevant handouts-e.g., Building Strong Families: Communication for Couples· Focusing Strategies- e.g., Engage members to record solutions· Summary Session-Review and reinforce coping strategies	

Table 2: Educational Workshop for OEF/OIF Veterans and Family Members

MFG for TBI: How it can Help	<i>MFG for Veterans with TBI Provides:</i> <ul style="list-style-type: none"> · <i>Education:</i> Guidelines to improve family relationships and communication · <i>Social Support:</i> Increases support network for veterans and families
DAY 2: Impact of Deployment on Veterans and Families	<ul style="list-style-type: none"> · <i>Reintegration stressors:</i> Injuries/ disabilities, adjustment to civilian lifestyle, altered relationships and changed roles/ responsibilities within the family · <i>Posttraumatic Stress Disorder is:</i> A common condition associated with TBI, characterized by re-experiencing, hyperarousal, avoidance and emotional numbing, and impacts spousal and parent-child relationships
The Family and Adjustment	<ul style="list-style-type: none"> · <i>Common responses:</i> Loss, grief, anger, frustration · <i>Loss for persons with TBI:</i> Physical/cognitive functioning, personal freedom · <i>Loss for families:</i> Loss of partner as s/he knew him/her, loss of leisure/personal time · <i>Coping Strategies:</i> Normalize feelings, focus on positives, avoid criticism, self-blame, use educational, health/mental health services

Appendix 3: Presentation for 2010 National VA Mental Health Conference

Multi-Family Group Intervention for OEF/OIF Traumatic Brain Injury Survivors and Their Families

PI - Deborah Perlick, PhD, VISN 3 MIRECC
Co-PI – Adrian Cristian, MD Bronx VAMC
Site PI - Kristy-Straits Troster, PhD (Durham)

Funded by Department of Defense W81XWH-08-2-0054

Multi-family Group Therapy for OEF/OIF Veterans with TBI: Rationale

- 22+% of surviving soldiers combat wounded in Iraq and Afghanistan are estimated to have traumatic brain injury
- Survivors face physical, cognitive, behavioral and emotional problems affecting community re-integration
- Survivors' spouses, parents and children face long-lasting changes to family life and their roles within the family
- Multi-family group therapy, developed by MacFarlane (1996) for SMI, has been adapted for civilian TBI and shown to improve outcomes for both survivors and family members (Rodgers et al., 2007)

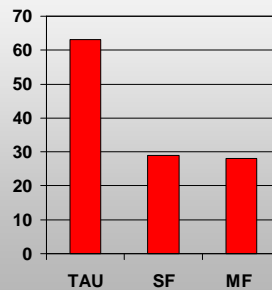
Multi-family Group Treatment

- Multi-family Group Treatment (MFG) is an evidence-based form of family psychoeducation for SMI.
- Meta-analyses of family psychoeducation studies have demonstrated greater recovery for consumers with family treatment as compared to individual treatment or treatment as usual.

Impact of Single-Family, Multiple-Family, and Combined Approaches on Relapse Rates in Major Outcome Trials

- Average relapse rates across 11 RTC's (N = 895)
- Mean length of treatment = 19.7 months

McFarlane, W. R., Dixon, L., Lukens, E., Lucksted, A. (2003). Family psychoeducation and schizophrenia: a review of the literature. *Journal of Marital and Family Therapy*, 29(2), 223-245.



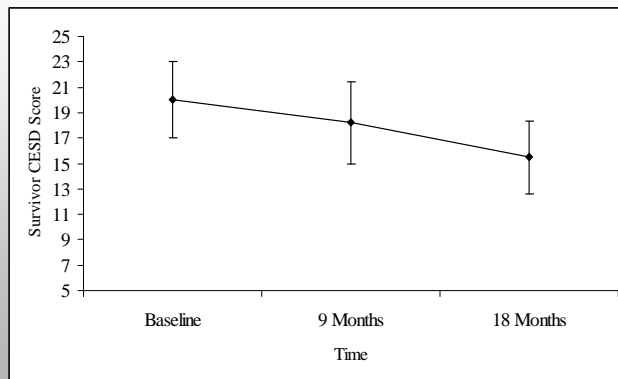
Multiple-Family Group Treatment for TBI : Preliminary Outcomes

- Survivors reported a decrease in depressive symptoms and anger expression and an increase in life satisfaction
- Family caregivers reported a significant reduction in burden.

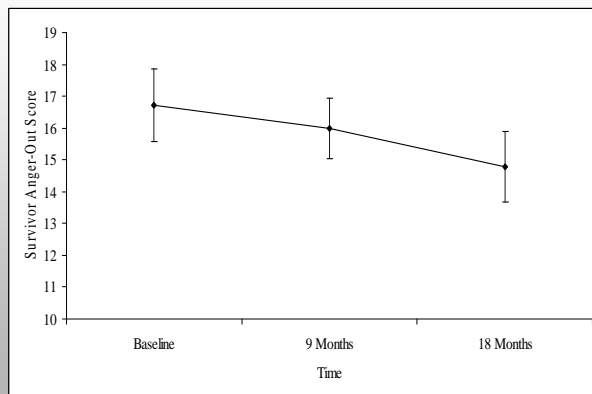
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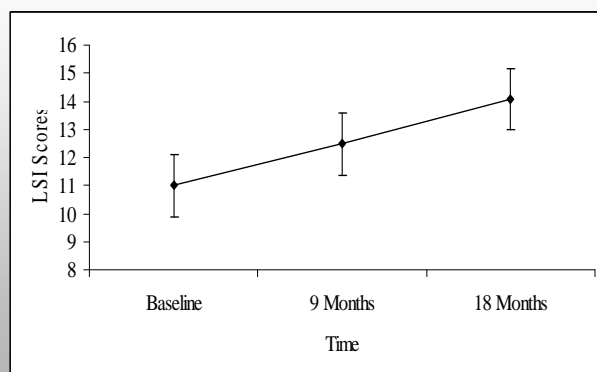
Survivor Depression



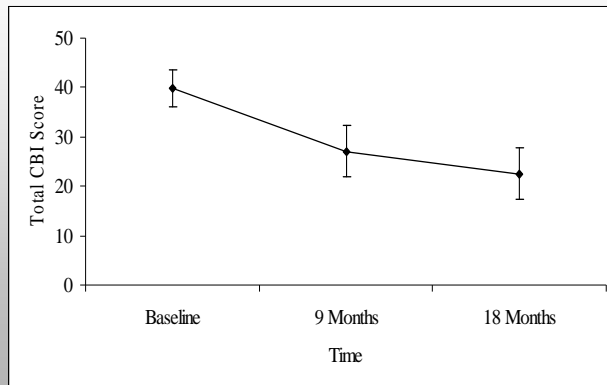
Survivor Anger



Survivor Satisfaction



Caregiver Burden



Multiple-Family Group Treatment for TBI: Preliminary Outcomes

Themes that emerged from qualitative analyses included:

- Normalization of the care giving experience
- Importance of socialization-improvement in a variety of coping skills
- Education about the injuries

Rogers, M., Strode, A, Norell, D., Short, R., Becker, B., & Dyck, D.G.;
Am. J of Phys. Med and Rehab, 2007.

Aims of Present Study

#1: To adapt the Multi-family Group Therapy model to address the needs of OEF/ OIF veterans with TBI and their family members.

2: To evaluate the feasibility and efficacy of MFG for OEF/ OIF veterans with TBI and their family members.

Overview of Multi-family Group Therapy

- **Joining:** two or three sessions with individual TBI survivors and families.
- **Educational Workshop:** 5-6 hour educational workshop with all the TBI survivors and families.
- **Group Meetings:** once every two weeks for 9 to 12 months, with all the TBI survivors and families. Group meetings are led by the family clinicians. Group meetings provide education, support, practical guidelines and solutions to everyday problems.

Problem Solving MFG Meetings

Structure

- | | |
|-------------------------------|------------|
| • Initial Socializing | 15 minutes |
| • Go Around | 25 minutes |
| • Select a problem to work on | 5 minutes |
| • Solving a problem | 40 minutes |
| • Final Socializing | 5 minutes |



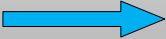
Initial Socializing

- 15 minutes of social conversation at the beginning and 5 minutes at the end of each session
- A time to network with others
- Opportunity to learn about other members lives
- Time for humor
- Content is kept light
- Small talk




Go Around

- Review the last couple of week's events
- What has been going well related to the family guidelines and in general
- What could be better related to the family guidelines and in general


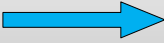
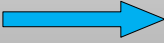
Formal Problem Solving

- | | | |
|----------|---|---|
| • STEP 1 |  | • Define the problem or issue (family & clinicians) |
| • STEP 2 |  | • List all possible solutions (All MFG members) |
| • STEP 3 |  | • Discuss advantages and then disadvantages (All) |

Formal Problem Solving

- | | | |
|----------|---|---|
| • STEP 4 |  | • Choose the solution that best fits the situation (family) |
| • STEP 5 |  | • Plan how to carry out the solution (family and clinician) |
| • STEP 6 |  | • Review implementation (clinicians) |

Formal Problem Solving

- STEP 1  • Define the problem or issue (family & clinicians)
- STEP 2  • List all possible solutions (All MFG members)
- STEP 3  • Discuss advantages and then disadvantages (All)

Comparison of Salient Attributes of Consumers/Families with Serious Mental Illness (SMI) vs. Traumatic Brain Injury (TBI)

<u>Category/Domain</u>	<u>Serious Mental Illness</u>	<u>Traumatic Brain Injury</u>
Usual Family Participant	<i>Parent</i>	<i>Spouse</i>
Onset of Illness/Condition	<i>Gradual, adolescence</i>	<i>Acute injury during combat</i>
Comorbid Conditions	<i>Few (substance misuse)</i>	<i>Many (PTSD, depression, other anxiety disorders, sleep problems, substance misuse, pain, medical conditions)</i>
Usual Patient Gender	<i>Mixed</i>	<i>Predominantly male</i>
Premorbid Context	<i>Civilian</i>	<i>Military, combat</i>

Adaptations for MFG for Veterans with TBI and Family Members: Workshop

- **Format** – Educational workshop delivered over 2 sessions
- **Contents** – Education on TBI
 - Defined diagnosis, treatment and impact of comorbid conditions (e.g., PTSD) in addition to target diagnosis of TBI
 - Visually enhanced presentation
 - Supplemented presentation with handouts

Adaptations for MFG for Veterans with TBI and Family Members: Joining

- **Specifications for conjugal couples**
 - Pre-workshop education (normalization of marital conflict/distress, health benefits/costs of positive vs. negative thinking/acceptance, negative impact of PTSD)
 - Introduction of skill tailored to couple's situation
 - Formulation: couples' functioning, goals, commitment contract

Adaptations for MFG for Veterans with TBI and Family Members: Joining

Joining aids – Added ecomap of support structure to traditional joining aids (genogram, SWOT analysis) to identify extra-familial sources of social support

Adaptations for MFG for Veterans with TBI and Family Members: Group Sessions

- **Multimodal reminders of sessions** – distributed advance schedule of meetings, reminder calls, aid with PDA entry
- **Active interventions to keep members on task** – e.g., Engaged members as recorders during problem-solving
- **Tools** provided PRN – e.g., Building Strong Families: Communication for Couples
- **Intersession support** – individual family sessions as needed
- **Summary Session** – added summary session to list and reinforce coping strategies implemented during MFG

Adaptations for MFG for Veterans with TBI and Family Members: Therapist Role

- **Liaison** – More active liaison with other service providers
- **Stigma** – Awareness/reduction skills, e.g. normalization
- **Engagement** – Use of Motivational enhancement techniques
- **Knowledge about**
 - PTSD and other comorbid conditions
 - Prescribed electronic memory aids

Demographics: Age, Gender, Ethnicity & Marital Status

Variable	Veterans	Family Members
Age (years)	34.9 ± 8.5	34.1 ± 11.3
Gender (% Male)	17 (85.0)	2 (10.0)
Ethnicity (%)		
Caucasian	9 (45.0)	8 (40.0)
African-American	8 (40.0)	5 (25.0)
Hispanic	3 (15.0)	7 (35.0)
Marital status: % Married/ Cohabiting	13 (65.0)	16 (80.0)

Demographics: Employment Status & Education

Variable	Veterans	Family Members
Employment Status (%)		
Full Time	7 (35.0)	10 (50.0)
Part Time	4 (20.0)	3 (15.0)
Unemployed/ Disability	7 (35.0)	5 (25.0)
Student	2 (10.0)	2 (10.0)
Education (>est grade)		
%12th	7 (35.0)	7 (35.0)
Post 12th	13 (65.0)	13 (65.0)

Clinical Features of Study Population

- 75% of veterans and 40% of family members score above the standard cut-off (>20) on a self-report scale for depression
- 65% of veterans and 20% of family members screened positive for mood disorder on the PHQ
- 50% of veterans and 20% of family members screened positive for an anxiety disorder on the PHQ

Clinical Features of Study Population

- 70% of veterans scored above the cut-off for PTSD on the PCL
- Veterans showed mild to moderate deficits in verbal memory, attention and executive functions

Problems Reported by Veterans with TBI and their Families for Use with Group Problem Solving

Family and Relationship Issues

- Family “walking on eggshells” to avoid emotional outbursts
- Reduced emotional or physical intimacy; isolation
- Time demands on burdened spouse/family
- Reduced or poor communication
- Difficulty managing finances
- Parenting conflicts and disagreements
- Binge drinking
- Frustration with veteran’s symptoms, cognitive problems

Problems Reported by Veterans with TBI and their Families for Use with Group Problem Solving

Veteran Problems Related to TBI/PTSD

- Losing or misplacing important items (keys/wallet/phone)
- Forgetting to take medications or reorder them when low
- Missing important medical and family appointments
- Erratic driving causing accidents, getting lost
- Trouble setting goals or planning realistically
- Acting/making decisions impulsively

Problems Reported by Veterans with TBI and their Families for Use with Group Problem Solving

Veteran Problems Related to TBI/PTSD cont.

- Irregular sleep patterns; insomnia; nightmares
- Trouble modulating anger, negative thinking; hopelessness
- Suspiciousness, paranoid ideas
- Difficulty with self-expression, verbal communication
- Misinterpreting what others are saying
- Frustration with compensatory strategies & treatments

Problems Reported by Veterans with TBI and their Families for Use with Group Problem Solving

Identity/Interfacing with community

- Grief about loss of military retirement dreams
- Grief about loss of partner as s/he used to be
- Difficulty accepting one's new limitations
- Feeling damaged or self-conscious
- Knowing how to tell others about TBI
- Difficulty negotiating work accommodations

Case Example of Problem Solving

Case Example: Steps	Veteran
Select and define goal/ issue	Remember to order prescription refills
Select a strategy from group-generated solutions after discussing pros/cons	<ul style="list-style-type: none"> - Use multiple reminders, e.g. write key appointments on household white board. - Hit "snooze" or "later" when dismissing PDA reminder. - Use a pillbox. Group member shared unobtrusive pillbox that could be used to facilitate adherence.
Results	<ul style="list-style-type: none"> - No longer dismissing medication reminders - Using white board for other issues.

Case Example of Problem Solving

Case Example: Steps	Family Member
Select and define goal/ issue	Improve self care when dealing with work stress and partner's moods
Select a strategy from group-generated solutions after discussing pros/cons	<ul style="list-style-type: none"> - Go outside and do something physical (cut wood) - Post a sign or note saying "I am out for Private Time" - Turn off cell phone during Private Time
Results	<ul style="list-style-type: none"> - Announced personal time to family rather than make a sign when going out to cut wood, felt better and reported weight loss.

Appendix 4: Abstract for Presentation at 2010 American Psychological Association Conference

Adaptation of Multi-Family Group Treatment for Veterans with Traumatic Brain Injury and their Families

D. Perlick, K. Straits-Troster, D. Norell, N. Berger, E. Bonuck, J. Close, C. Calvin, T. Dolber, and D. Dyck

Over 320,000 recent combat veterans are estimated to have traumatic brain injury (TBI), and more than half of these also report symptoms of depression or posttraumatic stress disorder (RAND, 2008). The long-term effects of TBI are still poorly understood, but family life and social reintegration are known to be impacted. The Multi-Family Group (MFG) treatment model has been shown to be effective for families dealing with schizophrenia and more recently, civilian TBI. A new multi-site study underway in the Bronx, NY and Durham, NC, is currently adapting the MFG model to provide education about TBI, PTSD and depression, enhance problem-solving skills and reduce distress and social isolation among veterans injured during military deployment and their family members. Following 2-3 individual family meetings with a clinician, veterans and family members participate in a psychoeducational workshop with several other families and in bi-weekly mfg meetings for 6-9 months. Pre and post-treatment assessments are conducted to evaluate preliminary efficacy.

Two emerging themes suggest further modifications to the model. As most family members are spouses/spouse equivalents and often parents, protracted absences during deployments have created tensions and conflict that are not well-addressed within the MFG. Currently 2-3 couples have adjunctive marital therapy; future groups might incorporate couples' work into the joining phase prior to initiation of the mfg. In contrast to the SMI population, combat veterans are premorbidly high functioning, held positions of authority and are action-oriented, suggesting the benefit of a shorter, more intensive treatment moving into problem-solving more quickly. Clinical vignettes to illustrate these points will be provided. Post-treatment veteran and family member focus groups will provide important input into useful modifications to the model for this group of veterans and their families.

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